dying in 1869 on the birth of her son, Robert, now the zoologist, geographer, and antiquarian of Magdalen College, Oxford; his second wife was Theodora Drake, of Fowey, a lineal descendant of a brother of Admiral Drake, who, with a son, survives him. Dr. Günther was one of the kindest parents, and spared neither time nor pains for the comfort, education, and happiness of his family, to whom, and to all who knew him intimately, he was endeared.

As a great systematic zoologist, as a naturalist who had early and independently worked out many of the problems of the distribution of animals, as a man of untiring energy and great powers of administration—these, and his solid work in the museum he loved so well, will ever be his best monument.

NOTES.

THE KING, accompanied by the Queen, opened the new session of Parliament on Tuesday, February 10. In his speech to the assembled Houses, he stated that among other measures to be presented would be one to give effect to the proposals, which were announced last session, for the development of a national system of education.

PROF. J. G. FRAZER has been elected a member of the Athenæum Club under the provisions of the rule which empowers the annual election by the committee of three persons "of distinguished eminence in science, literature, the arts, or for public service."

WE announce with much regret the death on February 6, at sixty-five years of age, of Mr. H. B. Woodward, F.R.S., formerly assistant-director of H.M. Geological Survey.

ACCORDING to the *Revue Scientifique* the Russian Minister of Public Instruction has made a grant of 100,000 roubles (10,570*l.*) to the St. Petersburg Academy of Sciences to assist a search for radio-active minerals throughout the Russian Empire.

THE death, on January 12, is announced, at seventy-seven years of age, of Dr. C. M. Woodward, emeritus professor of mathematics and applied mechanics in Washington University, and past-president of the American Association for the Advancement of Science.

AT the annual general meeting of the Royal Astronomical Society, to be held to-morrow, February 13, the gold medal of the society will be presented to Prof. Max Wolf, director of the Heidelberg Observatory, for his work in celestial photography and spectroscopy. Prof. Wolf is expected to be present at the meeting.

DR. W. E. FARABEE, who is leading an expedition in Brazil on behalf of the University of Pennsylvania, has sent home word of the success of the first part of his journey. He had passed through the territory inhabited by the Macusi Indians, and had encountered several of the Carib tribes that were supposed to have disappeared, including the Wai Wai tribe. The ethnological study of these early inhabitants of the Caribbean region is one of the main objects of the expedition.

SIR ERNEST SHACKLETON stated at the Royal Geographical Society on Monday that on his forthcoming Antarctic expedition he proposes to take four geologists, two meteorologists, and two biologists. His scientific staff will be distributed as follows:—Trans-Continental party, one geologist; western party towards Graham Land, one geologist and another man of science; eastern party to Enderby Land, one geologist; Weddell Sea base, one meteorologist and one biologist; on board the ship one biologist, and Captain Davis, hydrographer; supporting party from the Ross Sea side, one geologist. The various parties will be sure to bring back sufficient results to justify the purely scientific side of the expedition. The main object of the expedition is the crossing of the south polar continent from sea to sea; and the very nature of the journey will solve the question of a divided or a single continental mass.

CORRESPONDENTS of *The Times* report that four slight, though distinct, earthquake shocks were recorded on February 10 by the seismographs at Albany and Washington. The tremors extended from Brooklyn to Buffalo, through Connecticut and Pennsylvania, and north to the district along the St. Lawrence River. The seismograph at the Museum of Natural History in New York shows that the shocks began at 1h. 35m. p.m., and ended at 1h. 37m. 30s. Two pronounced earthquake shocks were registered by the seismograph at Toronto Observatory—one at 11.30 a.m. and the other at 1.29 p.m. The shocks were felt generally throughout the province. The entire St. Lawrence valley around Montreal was also affected.

As announced in *The Times* of January 30, Lord Tankerville has presented to the Zoological Society a young pair of the white cattle from his park at Chillingham, Northumberland. According to an article in the same journal of February 2, the animals were caught as yearlings by enticing them with food into a trap. Although the Chillingham and other white park cattle are often termed "wild," they are really descendants of domesticated breeds which have reverted to a semi-wild state.

INFORMATION has been received that through the generosity of Mrs. Rotch, the observatory at Blue Hill, near Boston, founded by the late Prof. Lawrence Rotch, for the study of the upper air, and partially endowed by his bequest of fifty thousand dollars, has been established for five years in connection with Harvard College. Mr. McAdie, formerly in charge of the Californian section of the United States Weather Bureau, has been appointed director of the observatory, and at the same time professor of dynamical meteorology in Harvard University. We also understand that provision is to be made in connection with the French department of war for continuing the aërological work carried on by the late M. Léon Teisserenc de Bort, at his observatory at Trappes.

WE learn from *The Times* that the Austrian Geographical Society has decided to honour the memory of Captain Scott by the posthumous award of the Hauer medal, the highest distinction the society has to offer. Another tribute to Captain Scott's memory is the erection, on the Col du Lautaret, a pass in the French Alps, at the suggestion of Dr. Charcot, of a rough stone cairn with a bronze tablet bearing the inscription:—"Captain R. F. Scott, of the English Navy, who, on his return from the South Pole, died bravely with his companions for his country and for science about March 25, 1912, stayed at Lautaret in March, 1908, to prepare for that memorable expedition."

As there will be no meeting of the British Association at home this year, it is proposed to hold in Edinburgh on Tuesday, September 8, and the four following days, a conference of observers and students of meteorology and allied subjects. One of the objects of the conference is to bring together observers in meteorology, climatology, oceanography, limnology, atmospheric electricity, terrestrial magnetism, and seismology, as well as persons who are interested in the discussion of the observations. Special attention is to be directed to the teaching of meteorology in schools and to the relation of meteorology to aviation. To ensure the success of the conference, it is important that the organising committee should know as soon as possible the names of those who propose to attend, and such persons are invited to communicate with Mr. F. J. W. Whipple, honorary secretary, at the Meteorological Office, South Kensington, S.W. The representative character of the organising committee, of which Dr. W. N. Shaw is chairman, and to which further additions are to be made, augurs well for the success of the conference.

It is with sincere regret that we record the untimely death of Major G. E. H. Barrett-Hamilton, which, according to a cable message received at the Natural History Museum, occurred on January 17 from heart failure in South Georgia, where the deceased naturalist was conducting an investigation into the whaling industry on behalf of the Colonial Office and the museum. Of Irish nationality, and inheriting a patrimony at Killmanock, county Wexford, Major Hamilton was born in 1871, and was educated, first at Harrow, and finally at Trinity College, Cambridge. Very soon after taking his degree—if not, indeed, before—he began to devote attention to the mammals of the British Isles, one of the earliest—if not the very earliest—of his papers being on the marten in Ireland, published in *The Zoologist* for 1894, while in the following year he established, in conjunction with Mr. O. Thomas, the distinctness of the Irish stoat. This line of research culminated in "A History of British Mammals," of which fourteen parts have been already issued, this being the only work in which the subject is treated on a thoroughly modern scientific basis, and which will remain as the best memorial to its talented author. In 1896 Major Barrett-Hamilton accompanied Prof. d'Arcy Thompson to Bering Sea, as the British representatives on the Fur-Seal Commission, in which capacity he did a large amount of excellent work. This no doubt led to his being appointed last summer to the aforesaid South Georgian whaling mission, on which he started in October.

The executive committee of the fourth International Botanical Congress, to be held in London next year, in conjunction with Dr. Briquet, the *rapporteur général* for the section of nomenclature, has issued a circular relating to the work of this section at the congress. This will consist in the completion of the rules of botanical nomenclature, issued as the result of the meetings at Vienna (1905) and Brussels (1910), by the settling of certain points left over from those meetings. The programme of work for 1915 was defined by the congress of 1910 as follows:—(1) To fix the starting point for the nomenclature of (*a*) Schizomycetes, (*b*) Schizophyceæ, (*c*) Flagellatæ, (*d*) Bacillariaceæ; (2) to compile lists of *nomina generica utique conservanda* for (*a*) Schizomycetes, (*b*) Algæ, (*c*) Fungi, (*d*) Lichens, (*e*) Bryophyta; (3) Compilation of a double list of *nomina generica utique conservanda* for the use of palæobotanists; (4) discussion of motions relating to new points which were not settled by the rules adopted at Vienna and Brussels. The carrying out of this work has been entrusted to two committees under the direction of a *rapporteur général,* Dr. J. Briquet (Geneva), assisted by Prof. H. Harms (Berlin). Copies of this circular, which contains lists of the committees and subcommittees for the various groups and other information, may be obtained from the general secretary, Dr. A. B. Rendle, British Museum (Natural History), Cromwell Road, S.W.

Detailed plans have been published for the work of the British Antarctic Expedition under Mr. J. Foster Stackhouse. The main object will be to ascertain something of what lies between King Edward VII. Land in the Ross Quadrant and Graham Land in the Weddell Quadrant, and whether the former is a part of the Antarctic continent, or insular. The expedition will use Scott's vessel, the *Discovery,* which is intended to leave London on August 1, 1914. She is to proceed by Cape Town and Bouvet Island, the Sandwich Islands, and South Georgia to the Falkland Islands, and thence to sail for Graham Land at the end of 1915. Here exploration and scientific work are to be carried on for a year or more, the *Discovery* meanwhile working south and east. The landing party, having been relieved and reprovisioned, will explore between Graham Land and King Edward VII. Land in 1916, and after wintering, a sledging expedition will make for the Bay of Whales in King Edward VII. Land, whence the *Discovery* will convey them home by New Zealand and the Panama Canal. Lieut. A. E. Harbord, R.N., will command the ship, and the party will include Lord Congleton, Captain A. S. Cantrell, Mr. W. H. Stewart Garnett, and Mr. D. H. Pearson, as surveyors and in other capacities, while the Master of Sempill will undertake meteorological work and also the care of the electrical and motor mechanical appliances. The expedition is expected home in the later part of 1917, and its total cost is estimated at 25,000*l*. If expeditions now in the Antarctic field or about to enter it should all succeed in their various objects, the next few years should bring a working outline knowledge of Antarctica.

MR. A. F. R. WOLLASTON on January 26 described before the Royal Geographical Society his journey in Dutch New Guinea in 1912. His principal object was to ascend to the snowy ridge of Mount Carstensz, and to see what lies beyond (which is unknown); in this he only just failed of success. A canoe accident (not the first of its kind on a New Guinea river) deprived him on his return journey of valuable records and effects. In spite of these misfortunes he has brought back much valuable information concerning the physical geography and biology of the country traversed (the Utakwa valley), and also its inhabitants. These last he divides into the coast people and the mountain people, who live at elevations from 4000 to 6000 ft. or more. He also encountered a third class, of wanderers believed to come from the west. The appearance and habits of the mountain people, and their struggle for existence, were vividly described. Mr. Wollaston was accompanied by Mr. C. Boden Kloss, of the Kwala Lumpor Museum, who undertook the zoological and botanical work; he also acknowledged much practical assistance from the Dutch authorities. As regards the physical features of the country, he commented (among much else of interest) on the remarkably complex structure of the foothills, and traced the diminution in the thickness of the jungle undergrowth at about 7000 ft. of altitude, the change from the lower forest trees to pandanus and casuarina at 8000 ft., and the disappearance of trees above 10,500 ft. His progress was stopped by precipitous rocks and an ice-wall at 14,866 ft., not 500 ft. below the summit-ridge.

THE issue of *The National Geographic Magazine* for January is wholly devoted to a finely illustrated article by Mr. F. E. Johnson, entitled "Here and There in Northern Africa." It contains a splendid series of photographs depicting the racial types, particularly those of the Ouled Nail dancing girls, whose performances are familiar to visitors to Biskra. The pictures of life in the harem and in the oases are very striking, while those of the moving sand-dunes with waves like those of the sea produced by wind action are of special interest.

PROF. DALL' OSSO, of Ancona, announces an important archæological discovery in the shape of a burial-place of the Stone Age in the Valle Vibrata, in the Abruzzi. The bodies were not buried, but laid in small huts containing from two to eight each, arranged on low platforms sloping towards the centre. With a single exception the bodies all rest on one side, with the knees drawn up, a position not unlike that of the crouching pre-dynastic Egyptian, in Case A of the first Egyptian room in the British Museum. The articles found with the remains, especially the vases and other utensils, indicate a higher degree of civilisation than has been observed in other instruments of the Neolithic age.

FURTHER accounts of the excavations conducted by the British Museum on the site of Carchemish indicate that the results are more important than was anticipated. The excavation of the Acropolis has been to some extent disappointing, because much was destroyed by Roman work in the second century. But a large building recently unearthed shows a continuous series of reliefs cut in slabs of white limestone and black diorite alternatively. We have processions of the king, his family, and attendants. These slabs, which technically contrast with Mesopotamian work in height of relief and broad simplicity of treatment, deserve comparison with the best Assyrian sculptures. Much more can be done if funds are forthcoming, and it may be hoped that immediate measures will be taken to complete these excavations, which promise to throw welcome light on the little-known Hittite culture.

DR. MILLARD'S Chadwick Lectures on the subject of "The Vaccination Question in the Light of Modern Experience," are well worth careful reading. We dislike the phrase, "The Vaccination Question," for it conveys to many minds a vague notion that vaccination does not protect against smallpox. The only vaccination question is, whether "the Leicester method" can so ensure a community against smallpox that the community can wisely disregard the use of infantile vaccination. In forty years, Leicester has had only forty-six deaths from smallpox; that is very few. Doubtless, if these forty-six persons had been well vaccinated just before they were exposed to the disease, the number of deaths would have been not forty-six, but none. Dr. Millard rightly says that "in the rather remote contingency of a really serious epidemic of smallpox occurring again in Leicester, or in any town, he would advise everyone to get vaccinated, even though they had already been once vaccinated." But the phrase, "a really serious epidemic," implies a good deal of disease among those who have not got vaccinated. Doubtless, Leicester, with its magnificent sanitary service, and its not unnatural pride over its own health, and a cordon of less unvaccinated towns round it, is what one calls "fairly safe"; but contingencies, even remote contingencies, do sometimes take form in fact. We have to reckon with "unrecognised cases, especially when occurring in the tramp class," and with a host of our individual civic and domestic responsibilities, and with the bare possibility that the remnants of smallpox in this country may of themselves increase in strength.

VOL. VII. of the *Boletim do Museu Goeldi* (*Museu Paraense*), which relates to the years 1909–10, although only published in 1913, contains a narrative, illustrated by photographs of natives and scenery, of a journey from Xingú to Tapajoz, undertaken by Dr. E. Snethlage, as well as a report on scientific explorations in Pará by Mr. A. Dueke.

IN an article published in *The Egyptian Mail* of January 15 it is stated that, among other additions, the Giza Gardens have acquired a second specimen of the white-eared kob (*Cobus cob leucotis*) from the swamps of the White Nile. These two are believed to be the only examples of this antelope brought alive from the Sudan, the first having been received nearly two years ago. It is also mentioned that Mr. J. L. Bonhote, who joined the staff of the gardens some time ago, is at present rearranging the museum.

THE report of the (Egyptian) Zoological Service for 1912 contains reproductions from photographs of some of the more interesting animals in the Giza Zoological Gardens. The Government, it appears, has been taking measures for the protection of certain kinds of birds, particularly the cattle-egret (*Ardea bubulcus*). That species has suffered so severely from the plume-hunters that in the spring of 1912 only a single breeding colony remained in the whole of Lower Egypt. Thanks, however, to protective measures, more than 500 young birds were bred under natural surroundings under the care of a watchman of the Zoological Service. In Upper Egypt one large breeding colony remains, and, as the watchman reported the presence of a very large number of young birds in the country, there may be others.

IN *Symons's Meteorological Magazine* for January Mr. R. C. Mossman concludes the seventh of his interesting articles on southern hemisphere seasonal correlations, with some remarks as to the practical value of this class of research. He considers it almost certain that interaction is world-wide, but that even to-day there are not sufficient weather data for many regions. As an essential feature of this study a bipolar campaign is suggested, and also that the equatorial belt should be specially investigated. The method of using the preceding weather in one part of the earth as a means of arriving at a knowledge of what will subsequently take place in another part has already had practical application in determining the probable intensity of the Indian monsoon. He thinks that the establishment of a world-bureau is the only way to meet the situation, owing to the enormous labour involved; this question has, however, been discussed at several of the international meetings, but all efforts to found such an institution have hitherto failed.

THE December number of *Terrestrial Magnetism and Atmospheric Electricity* contains the results of the determinations of magnetic declination made by the survey ship *Carnegie* on the voyage from St. Helena to Falmouth during the autumn of 1913. From these results it appears that the British chart of the Atlantic shows the westerly declination too small by about 0·7° over that part of the course between latitudes 5° south and 20° north, and about the same amount too great between 35° and 45° north. According to a note in the same number the *Carnegie* has now returned to New York, having completed her circumnavigation cruise of 70,000 miles commenced in June, 1910.

THE introductory remarks on galvanometers and their properties with which the Cambridge Scientific Instrument Company prefaces its new catalogue of those instruments will prove of the greatest value to all who have to deal with electrical measurements. They cover such subjects as the period, the damping, the steadiness of the zero, the resistance, and the sensitiveness of the instruments, and furnish a sounder scientific basis for the choice of a galvanometer for any special purpose than can be found outside the scientific papers dealing with the subject. In order to compare different types of instruments a "factor of merit" is calculated from the behaviour of each. It is defined as one hundred times the deflection in millimetres per micro-ampere at a scale distance of a metre, divided by the square of the undamped periodic time in seconds and by the two-fifth power of the resistance of the instrument. The values are roughly one hundred for the Ayrton-Mather ordinary, 700 for the short-period instrument, 7000 for the Paschen, 150 for the Broca, and 100,000 for the Einthoven string instrument. In the last case the comparison is somewhat doubtful, as the deflections are read through a microscope, and not in the standard way described in the definition.

ONE of the subjects dealt with in a recent paper by Mr. B. Welbourn, entitled "British Practice in the Construction of High Tension Overhead Transmission Lines," and published in the Journal of the Institution of Electrical Engineers for January 15, was protection against atmospheric disturbances. He expressed the opinion that no necessity exists in this country for earth wire protection above the power lines, as experience has shown that lightning troubles are very few and no more frequent than are mechanical faults on underground cables. Horn gap arresters, with or without choking coils, erected in the open air, especially in industrial districts, he condemned as wrong in principle, as well as being untrustworthy. The extensive use of electrolytic aluminium arresters is limited by the fact that they need charging every day from the line. Moscicki condensers are coming into favour slowly, possibly because of their high first cost. A novel method which has been found satisfactory has been developed by Messrs. Merz and McLellan, who have discarded arresters on all lines which are connected to the system through transformers. About 10 per cent. of the end turns on the line side of these are insulated with special materials to a thickness of 300 to 400 per cent. of the insulation on the remaining turns. Atmospheric disturbances on the line are reflected back by the end turns of the transformers, and the oscillations are damped out by the ohmic resistance of the line.

THE Mathematical Association has issued a catalogue of the current mathematical journals of all countries of the world, with lists of the libraries in Great Britain where they are taken in, and the dates at which the series commence and terminate when discontinued. This valuable little pamphlet is published by Messrs. G. Bell and Sons, Ltd., London, price 2*s*. 6*d*., and editorial communications for insertion in future issues are to be sent to Mr. W. J. Greenstreet, The Woodlands, Burghfield Common, near Mortimer, Berks. The present catalogue is issued on the understanding that it contains a first draft of the titles of current mathematical periodicals. Many periodicals of a general character containing mathematical articles are also included in its scope, though publications such as those of our Royal Society are excluded. The catalogue should be in every public library and in the library of every mathematician; it contains 182 entries.

In a recent issue of *The Chemical News* (vol. cix., p. 37, January 23, 1914), Dr. J. C. Cain describes some new experiments on the estimation of alcohol in beer by Malligand's ebullioscope. This instrument was invented in 1874, and tested thoroughly at that time with French wines and with German and Scandinavian beers, but appears to have been almost forgotten. The percentage of alcohol is determined by its influence in lowering the boiling point of the water; the solid contents of the wine and beer, being of high molecular weight, are almost without effect on the boiling point. The thermometer is provided with a movable scale, which can be set to correspond with the boiling point of water as it varies with changes in the barometric pressure. It is calibrated directly to correspond with percentages of alcohol, so that no tables or calculations are required. The whole determination can therefore be carried through in a few minutes by anyone who is capable of reading a thermometer. In a series of twenty-two analyses, the percentage of alcohol found in this way was usually within 0·1 per cent. of the percentage determined by the standard method of distillation.

The properties of alcohol and of stimulants in general in relation to their physiological effects form the subject of an address, given by Prof. H. E. Armstrong to the Institute of Brewing, which is printed in the December issue of their journal. The account given of the power of alcohol and its homologues, when used in moderate amounts, to penetrate the membrane which encloses the cell is a clear statement of facts which will have to be considered by the physiologist, and should do something to overcome the prejudice against alcohol which exists in the minds of otherwise fair-minded people. The ill-effects produced by alcoholic beverages are more probably to be ascribed to the presence of small proportions of still more active substances. The action of alcohol and similar hormones is to accelerate the rate of passage of water and diffusible substances through the cell walls. Probably the ordinary changes involved in the life of the living cell cannot go on without some kind of stimulus from without to disturb equilibrium, so that, particularly with a simple diet, some form of stimulant must be taken with the food. Such stimulants are not necessarily alcoholic, as one of the most common digestive stimulants is carbonic acid—*e.g.* aerated waters. Excess of such stimulants are contained in meat extracts, the supposed body-building power of which is almost entirely fictitious, being due to an increased proportion of water in the cells.

The strength of stayed flat plates forms the subject of a report issued by Mr. C. E. Stromeyer, chief engineer of the Manchester Steam Users' Association. Mr. Stromeyer has analysed and correlated a number of experiments on this subject, and suggests empirical formulæ for practical use. Some interesting information is included regarding working conditions. Thus, one of Mr. Stromeyer's inspectors examined recently a loco-portable boiler, and found that the firebox had wasted almost to the vanishing point. The thickness of the crown plate, as gauged by the inspector, varied from one-thirty-second to one-sixteenth inch, yet this flat plate had withstood satisfactorily a working pressure of 70 lb. per sq. in., the stays being pitched at $5\frac{1}{4} \times 4\frac{1}{2}$ in. centres. No bulging was reported. Reference is made to Bach's experiments, and we are reminded that fuller details of these experiments may be expected shortly.

Teachers of geography who have adopted modern methods of instruction should examine the coloured "Contour Hand Maps" of the counties of England and Wales which are being published at the price of 2*d*. net each by Messrs. G. W. Bacon and Co., Ltd. Judging from the eight specimen maps which have been received, teachers will have no difficulty in devising an abundance of practical exercises which will make easy to young people an appreciation of the relief of an area from a study of its contoured map.

OUR ASTRONOMICAL COLUMN.

Detonating Fireball of January 19.—Mr. W. F. Denning writes:—"A few minutes after 7 p.m. on January 19 a magnificent meteor was seen at Reading, Oxford, and other places in that part. It illuminated the sky with a brightness superior to the full moon, and startled many persons as the night had been very dark, and the transformation was almost instantaneous. The fireball traversed a long arc extending probably over 60°, at a slow rate of motion, the estimated duration being from five to seven seconds.

"A few minutes after the meteor had disappeared a heavy sound as of distant artillery was distinctly heard at many places, and there was a decided vibration of houses, the windows shook, crockery ware rattled, &c., as during an earthquake. At Oxford there was a loud report rather like thunder. At Finstock, Oxon., the noise is said to have resembled the boom of a heavy gun rather than a clap of thunder. At Shinfield, near Reading, and at other places in Berks, the doors and windows rattled. Certain persons who did not see the meteor thought that the disturbance was due to an earthquake shock. At Wallingford the sound followed the light three minutes, so that the explosion may have been about thirty-seven miles distant. This represents the motion of sound in ordinary air. In the rarer atmosphere of great elevations it travels much slower, and the distance may therefore have been greater. The fireball seems to have passed from N.E. to S.W. from Hertfordshire to Berkshire, at a height of about fifty-one to eleven miles. It had a luminous flight of about sixty-seven miles, and a velocity of about twelve miles a second.

"During the last fifteen years an unusually large number of fireballs have appeared in the month of January. Mrs. Fiammetta Wilson has informed me that there is an old Roumanian superstition that bolides may be abundantly observed from January 14–20, and especially on January 19."

Comet 1913*f* (Delavan).—Dr. G. van Biesbroeck, of the Uccle Observatory, sends to the *Astronomische Nachrichten*, No. 4711, his determinations of the parabolic elements and ephemeris of comet 1913*f*, discovered by Delavan. The former are based on observations made on December 19 and 29, 1913, and January 14 of this year, and the ephemeris satisfied the latest observation of this object made on January